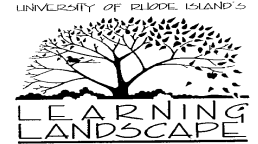




Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade K - 2
Worksheet #:	LS1(1)
RI GSE #:	LS1(K-2)1-1a

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Sort / classify different living things using similar and different characteristics. Describe why each organism belongs to each group or cite evidence about how they are alike or not alike.	Distinguish between living and non-living things.	<ul style="list-style-type: none"> ➤ WWW.Google.com: keyword “free clipart” ➤ CEOC Classroom Aid #: LS1(1) - 1 ➤ http://www.col-ed.org/cur/sci/sci153.txt

Suggested Activities

Using a collection of photographs, magazine clippings, or drawings of plants, animals, seeds, and non-living objects, ask the students to categorize the pictures by living and non-living. Tape or pin the pictures to a bulletin board by category during the course of the exercise. Use pictures from magazines or access the internet at WWW.Google.com for free clip art. Older students may be asked to prepare for this exercise by bringing in photographs, magazine clippings, or drawings from home.

Discuss what differentiates living things from non-living things (HINT: living things take in nutrients, grow, and reproduce). Using examples of several living and non-living things, make a chart on the board and have the students "check off" which characteristics apply to which thing. A trip to the garden or school yard can provide visual evidence of items to include on the list, including plants, insects, animals, soils, and landscaping materials. Students will enjoy collecting samples of non-living materials or living plants to bring back to the classroom. If you have access to a digital camera, help students to make a photographic record of the living organisms in their school garden. Besides plants, warm season residents might include various insects, spiders, worms, snails, frogs and toads. Don't forget to notice occasional visitors such as birds, squirrels, and chipmunks.

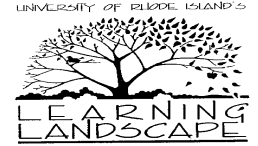
See: Classroom Aid #: LS1(1) -1.

Create a “touch and feel” box. See the following web page for instructions: <http://www.col-ed.org/cur/sci/sci153.txt>

Consider the following ideas if you would like to attract birds and animals to your garden space: (1) Install a bird feeder to attract birds, squirrels and chipmunks. Make sure to keep it filled, especially during the colder months! (2) Make a toad house out of an old clay pot. Turn the pot upside down and make a “door” using a small stone to prop up one corner about an inch. Nestle the upside-down pot in amongst the plants, and wait a few days before checking to see if a toad has moved in! (3) Choose flowering plants for their ability to attract hummingbirds and butterflies. (4) Place a few wide, flat stones on the earth between the plants. Tip them up periodically to see what kinds of creatures choose to live under a stone roof!



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade 3 - 4
Worksheet #:	LS1(2)
RI GSE #:	LS1(3-4)1-1a

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Sort / classify different living things using similar and different characteristics. Describe why each organism belongs to each group or cite evidence about how they are alike or not alike.	<i>Cite evidence</i> to distinguish between living and non-living things.	➤ GEOC Classroom Aid #: LS1(1) - 1

Suggested Activities

Discussion topic: Is a seed alive? How can we prove that a seed is alive? (This discussion should be tied to a planting experiment, such as the one that follows.)

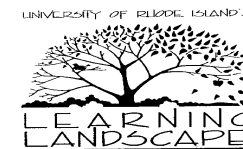
Do an experiment using a selection of packaged vegetable or flower seeds. Begin by having the students observe the physical characteristics of the seeds as they appear right out of the package. Read the back of the package to obtain the germination time for this type of seed. Next, place several seeds in a covered jar between two pieces of wet paper towel. Keep the towel moist and observe what happens over time. Discuss what things a seedling needs to continue to grow and thrive (water, air, sunlight, nutrients), and what will eventually happen if any of these things are absent (the seedling will die).

Make a chart of the primary features used to classify living things versus non-living things. Include an animal, plant, or non-living object that illustrates each point on the chart. A trip to the garden or school yard can provide visual evidence of items to include on the list, including plants, insects, animals, soils, and landscaping materials. Students will enjoy collecting samples of non-living materials or living plants to bring back to the classroom. If you have access to a digital camera, help students to make a photographic record of the living residents in their school garden. Besides plants, warm season residents might include various insects, spiders, worms, snails, frogs and toads! **See: Classroom Aid #: LS1(1) – 1** for an example.

Refer to the prior Worksheet LS1(1) for more ideas!



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade K - 4
Worksheet #:	LS1(3)
RI GSE #:	LS1(K-2)1-1b / LS1(3-4)1-1b

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Sort / classify different living things using similar and different characteristics. Describe why each organism belongs to each group or cite evidence about how they are alike or not alike.	<p>K - 2: Identify and sort based on similar or different external features.</p> <p>3 – 4: Identify, sort <i>and compare</i> based on similar and/or different external features.</p>	<ul style="list-style-type: none"> ➤ http://www.col-ed.org/cur/sci/sci159.txt ➤ www.fw.vt.edu/dendro/forsite/key/intro.html ➤ www.teachplants.okstate.edu

Suggested Activities

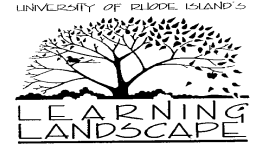
Go for a nature walk and collect seeds (consider dandelion, milkweed, mature flower seeds, maple "wings"), cones and nuts: ask students to compare and contrast physical characteristics of different seeds and seed cases, such as color, size, shape, and texture. *OR...* Ask students to collect as many different seeds as they can from the foods that they eat: coconut, mango, avocado, apple, orange, watermelon, nuts (*allergy warning), beans, etc. Compare and contrast physical characteristics. Add photographs of unique seeds to the collection. Visit the plant and seed identification website from the Department of Plant and Soil Sciences at Oklahoma State University to see pictures of seeds and the plants that produce them (www.teachplants.okstate.edu). Discuss how different types of seeds with different physical characteristics (adaptations) might be disseminated throughout the environment. Have students group and display the seed collection in as many ways as they can devise, explaining the rationale for their groupings.

Make castings of tree bark and use the casts in the classroom to classify different types of trees. See web page: <http://www.col-ed.org/cur/sci/sci159.txt> for instructions. What purposes might different bark designs serve in nature?

Go for a nature walk and collect as many different kinds of tree leaves as you can find. Use the information from a web site like the Virginia 4-H Leaf Identification Project to see how leaves are categorized and ultimately identified: www.fw.vt.edu/dendro/forsite/key/intro.html. Have students use crayons and construction paper to make leaf rubbings, which they can then staple or bind together to make individual leaf identification journals.



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade K - 2
Worksheet #:	LS1(4)
RI GSE #:	LS1(K-2)1-1c

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Sort / classify different living things using similar and different characteristics. Describe why each organism belongs to each group or cite evidence about how they are alike or not alike.	Observe and record the external features that make up living things (for example: roots, stems, leaves, flowers, legs, antennae, etc.)	<ul style="list-style-type: none"> ➤ CEOC Classroom Aid #:LS1(4) - 1 ➤ CEOC Classroom Aid #:LS1(4) - 2 ➤ CEOC Classroom Aid #:LS1(4) - 3 ➤ http://kids.yahoo.com/animals/mammals

Suggested Activities

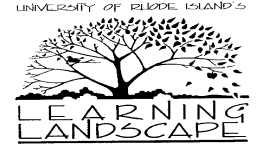
Bring a potted flowering plant into the classroom, such as a mum, pansy, or other simple-structured annual. Begin by discussing the primary parts of the plant. Have students create a drawing from observation that includes the primary external features. Gently pull the plant out of the pot to reveal the root structure buried under the soil. Older students can label the parts of the plant they have drawn, while younger students can verbally describe their drawing to the teacher or class. This exercise could be followed by a trip to your school garden or local park to observe the common characteristics of different types of plants and trees.

Using photos of common mammals, insects, or birds, ask students to identify as many anatomical features as they can. Older children can draw their own pictures and label as many parts as they can. Students can prepare for this exercise by bringing in photographs or magazine clippings from home. Yahoo Kids has a good list of mammals with descriptions that can be used as a reference source: <http://kids.yahoo.com/animals/mammals>.

Given an illustration of a plant / animal / bird, students will label body parts using words from a vocabulary list. **SEE CEOC Classroom Aids #: LS(4)-1, LS(4)-2, LS(4)-3.**



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade 3 - 4
Worksheet #:	LS1(5)
RI GSE #:	LS1(3-4)1-1c

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Sort / classify different living things using similar and different characteristics. Describe why each organism belongs to each group or cite evidence about how they are alike or not alike.	Record and analyze observations about external features (for example, within a grouping, which characteristics are the same and which are different.)	http://www.inhs.uiuc.edu/inhsreports/fall-2000/leaf.html http://www.fw.vt.edu/dendro/forsite/key/intro.htm http://teacher.scholastic.com/dirtrep/index.htm CEOC Classroom Aid #: LS1(5)-1

Suggested Activities

Take a nature walk to examine trees. Identify at least three different types of trees: note similarities and differences in height, girth, bark texture, branching patterns, and leaf structure. Collect leaves from different types of trees to make leaf-prints. Help students make their own individual leaf identification guides. Virginia Tech has a great leaf identification guide that will work for teachers and students alike: <http://www.fw.vt.edu/dendro/forsite/key/intro.htm>.

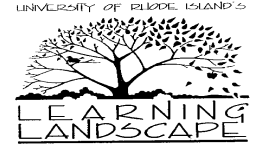
Visit the Scholastic web site that talks about animal adaptations: <http://teacher.scholastic.com/dirtrep/index.htm>.

Play an animal adaptation game! **Use CEOC Classroom Aid LS1(5)-1** to help students explore different animal adaptations.

Ask students to choose an animal to investigate. (To ensure that a wide variety of animals are chosen, the teacher may elect to assign each student an animal to research.) For homework, have each student write a short report describing their animal. Follow this up with a classroom activity: working in pairs, have each student share their report with a classmate. Ask each pair of students to come up with three ways in which the animals that they investigated are similar, and three ways in which their animals are different. Have each pair share their findings with the class.



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade 3 - 4
Worksheet #:	LS1(6)
RI GSE #:	LS1(3-4)1-1d

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Sort / classify different living things using similar and different characteristics. Describe why each organism belongs to each group or cite evidence about how they are alike or not alike.	Cite evidence (such as prior knowledge, data) to draw conclusions explaining why organisms are grouped / not grouped together.	CEOC Classroom Aid #: LS1(6)-1 CEOC Classroom Aid #: LS1(6)-2 CEOC Classroom Aid #: LS1(6)-3

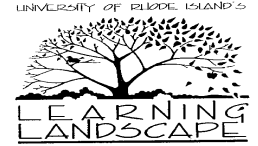
Suggested Activities

Make a chart of the primary features or characteristics used to classify animals using **CEOC Classroom Aid LS1(6)-1**. Make a bulletin board collage to illustrate the point: using pictures of different animals have students classify each animal under the appropriate category and explain why the animal belongs in that particular group. Perform the same activity comparing insects and arachnids using **CEOC Classroom Aid LS1(6)-2**.

Explore the differences between members of the plant kingdom. Use **CEOC Classroom Aid LS1(6)-3** to understand some of the different ways that plants are classified. Take this knowledge outdoors by looking at the plants in your school garden or local green-space. How might the plants in these environments be classified? What physical characteristics might be used to create groupings? Consider groupings such as deciduous trees versus evergreens, annual plants versus perennials, flowering plants versus non-flowering, grasses versus broad-leafed plants.



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade 5 - 6
Worksheet #:	LS1(7)
RI GSE #:	LS1(5-6)1-1a

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Using data and observations about the biodiversity of an ecosystem make predictions or draw conclusions about how the diversity contributes to the stability of the ecosystem.	Students demonstrate understanding of biodiversity by recognizing that organisms have different features and behaviors for meeting their needs to survive (e.g., fish have gills for respiration, mammals have lungs, bears hibernate).	CEOC Classroom Aid #: LS1(7)-1

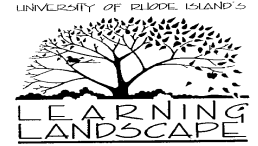
Suggested Activities

Use CEOC Classroom Aid LS1(7)-1 as a starting point for a discussion about animal and plant adaptations and how they benefit these organisms.

Bring your students to your school garden or local green-space. Have students make notes and drawings that describe the physical differences between different types of plants. Back in the classroom, students can share their observations with one another. Discuss why different adaptations may have developed. Name at least one benefit for each adaptation that is identified. For example: different stem configurations, flowers that face upwards versus those that face downwards, tubular flowers versus flat-faced flowers, hairy stems versus smooth stems, woody stems versus soft stems, very large leaves versus small leaves, spines, odor. Since many of the plants that we find in our gardens today are not native to North America, research the origins of a few species of non-native plants to see what kind of environment each originally developed in. For example, herbs such as rosemary and lavender originated in the Mediterranean region of the world, chili peppers were brought to the U.S. from Mexico and South America, and the eggplant originated in India.



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade K - 2
Worksheet #:	LS1(8)
RI GSE #:	LS1(K-2)2-2a

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Identify the basic needs of plants and animals in order to stay alive (i.e., water, air, food, space.)	Observe that plants need water, air, food, and light to grow; observe that animals need water, air, food and shelter to grow.	

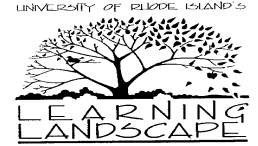
Suggested Activities

Have students discuss the importance of water, air, food, and shelter to a plant; to a wild animal; to a person. Thinking about each resource in turn, what would happen if this resource was not available for one hour? One day? One week? Longer? Which resource seems to be most critical to life? Does the importance of each different resource change depending on which living organism you are talking about?

Do an experiment that simulates different resource and environmental conditions for a growing plant: Using standard potting mix (which should contain a high proportion of organic matter), prepare five pots of seedlings using one variety of plant (note: green bean seeds germinate quickly and the seedlings are typically quite sturdy and easy to work with). Once the seedlings are well-established (at least three or four inches in height), perform the following experiment. POT #1: maintain adequate air, warmth, water, light. POT #2: withhold water but maintain all other conditions. POT #3: withhold light by keeping the pot under a box, but maintain all other conditions. POT #4: limit the amount of fresh air that the plant receives by placing it in a closed zip-lock bag. Only open the bag for a short period of time every few days to water the plant. POT #5: Transplant the seedling to a pot containing clean sand, but no organic matter. Maintain all other conditions. Students should journal what happens to the pots over a period of two weeks, using words and pictures.



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade 3 - 4
Worksheet #:	LS1(9)
RI GSE #:	LS1(3-4)2-2a

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

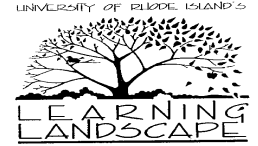
Assessment Target	Grade Span Expectation	Resources
Identify the basic needs of plants and animals in order to stay alive (i.e., water, air, food, space.)	Observe that plants need water, air, food, light, <i>and space</i> to grow and reproduce; observe that animals need water, air, food and shelter to grow and reproduce.	

Suggested Activities

Do an experiment with two sets of plants: plant two or three seeds in a large pot with plenty of space as well as water, air, food, light; overcrowd a second pot with many seeds and the same amount of water, air, food, light as the first pot. Have the students observe and journal what happens to the seedlings in the two pots over time. Which pot appears to be healthiest over time? Which pot contains plants that are likely to flower and produce seeds? If you have outdoor garden space to work in, this experiment can be replicated by planting quick-growing vegetable seeds, such as radishes, using the recommended spacing on the seed packet. Plant a second set of seeds very densely and observe the overall growth and health of the plants over time. Do both sets of plants produce fully-formed radishes? Hint: The crowded radish plants will likely produce only one or two edible radish roots. The rest of the crowded plants will have long, skinny roots with no edible bulb structure.



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade 5
Worksheet #:	LS1(10)
RI GSE #:	LS1(5-6)2-2a

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
<p>Describe or compare how different organisms have mechanisms that work in a coordinated way to obtain energy, grow, move, respond, provide defense, enable reproduction, or maintain internal balance.</p>	<p>Describe structures or behaviors that help organisms survive in their environment (eg. defense, obtaining nutrients, reproduction, and eliminating waste.)</p>	<p>CEOC Classroom Aid #: LS1(10)-1 CEOC Classroom Aid #: LS1(10)-2 CEOC Classroom Aid #: LS1(10)-3</p>

Suggested Activities

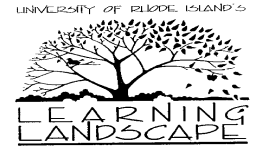
Discuss how animal teeth and claws help them to obtain food. Compare the flat, grinding tooth structure found in most herbivores with the longer, sharper tooth structure found in most carnivores. What do the teeth of omnivores look like? How do the beaks of various types of birds differ? Consider foot structure. Compare raptor claws with the webbed feet found in most water birds. Compare the feet of grazing animals with those of most predators. Help students draw conclusions about what the physical design of teeth, beaks, feet and claws can tell us about how animals and birds live. What role do other structures, such as horns play? Fur? Feathers? Scales? **Use CEOC Classroom Aid LS1(10)-3** to encourage discussion.

Think about aquatic animals and fish: what specialized structures do they possess? How do aquatic mammals differ from fish? **Use CEOC Classroom Aid LS1(10)-2** to help students visualize the differences between various aquatic organisms.

Look at various common insects and identify the structures that help them to survive (for example, endoskeletons, wings, specialized feeding apparatus.) Consider the differences between arachnids (spiders) and insects. **Use CEOC Classroom Aid LS1(10)-1** to help students distinguish the differences between these organisms.



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade K - 2
Worksheet #:	LS1(11)
RI GSE #:	LS1(K-2)3-3a/b

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Predict, sequence, or compare the life stages of organisms, both plants and animals.	Students demonstrate an understanding of reproduction by... <ul style="list-style-type: none"> (a) observing and scientifically drawing and labeling the life cycles of a familiar plant or animal. (b) sequencing the life cycle of a plant or animals when given a set of pictures. 	CEOC Classroom Aid #: LS1(11)-1,2,3

Suggested Activities

Use **CEOC Classroom Aid LS1(11)-1,2,3** to help students sequence the life cycle of a chicken, a Monarch butterfly, and seed-to-plant.

Learning from nature – Lesson planning aid

LS1 Life Sciences	Grade 3 - 4
Worksheet #:	LS1(12)
RI GSE #:	LS1(3-4)3-3a/b/c

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Predict, sequence, or compare the life stages of organisms, both plants and animals.	<p>Students demonstrate an understanding of reproduction by...</p> <ul style="list-style-type: none"> (a) observing changes and recoding data to scientifically draw and label the stages in the life cycle of a familiar plant or animal. (b) sequencing the life cycle of a plant or animal when given a set of data or pictures. (c) comparing the life cycles of 2 plants or 2 animals when given a set of data or pictures. 	<p>www.Monarchwatch.org CEOC Classroom Aid #: LS1(11)-2 CEOC Classroom Aid #: LS1(15)-1</p>

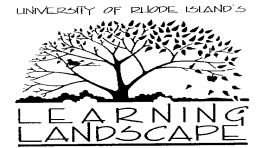
Suggested Activities

Visit www.Monarchwatch.org to learn about the life cycle of the Monarch butterfly. The site has plenty of worksheets, activities, and you can learn how to rear Monarch butterflies as a classroom activity! Use CEOC Classroom Aid LS1(11)-2 to help students understand the life cycle of the Monarch butterfly. Encourage Monarch butterflies in your own school garden by planting *Asclepias tuberosa*, butterfly milkweed.

Use CEOC Classroom Aid LS1(15)-1 as a starting point for a discussion about the similarities and differences between the life cycle of a chicken and a frog.



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade 5 - 6
Worksheet #:	LS1(13)
RI GSE #:	LS1(5-6)3-3a/b/c

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

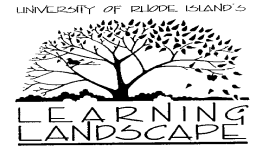
Assessment Target	Grade Span Expectation	Resources
Compare and contrast sexual reproduction with asexual reproduction.	<p>Students demonstrate an understanding of reproduction by...</p> <ul style="list-style-type: none"> (a) defining reproduction as a process through which organisms produce offspring. (b) describing reproduction in terms of being essential for the continuation of the species. (c) Investigating and comparing a variety of plant and animal life cycles. 	<p>www.Monarchwatch.org</p>

Suggested Activities

Visit www.Monarchwatch.org to learn about the life cycle of the Monarch butterfly. The site has plenty of worksheets, activities, and you can learn how to rear Monarch butterflies as a classroom activity! Encourage Monarch butterflies in your own school garden by planting *Asclepias tuberosa*, butterfly milkweed.



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade K - 2
Worksheet #:	LS1(14)
RI GSE #:	LS1(K-2)4-4a

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

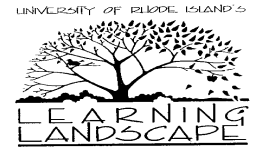
Assessment Target	Grade Span Expectation	Resources
Identify and explain how the physical structures of an organism (plants and animals) allow it to survive in its habitat / environment.	Students demonstrate an understanding of structure and function-survival requirements by identifying specific functions of the physical structure of a plant or animal (eg., roots for water or webbed feet for swimming).	CEOC Classroom Aid #: LS1(14)-1,2 CEOC Classroom Aid #: LS1(14)-3

Suggested Activities

Use CEOC Classroom Aid LS1(14)-1,2 to help students understand beak and foot adaptations in different types of birds.
Use CEOC Classroom Aid LS1(14)-3 to help students understand the role played by different parts of a tree.



Learning from nature – Lesson planning aid



LS1 Life Sciences	Grade 3 - 4
Worksheet #:	LS1(15)
RI GSE #:	LS1(3-4)4-a/b

Statement of Enduring Knowledge: All living organisms have identifiable structures and characteristics that allow for survival.

Assessment Target	Grade Span Expectation	Resources
Identify and explain how the physical structures of an organism (plants and animals) allow it to survive in its habitat / environment.	Students demonstrate an understanding of structure and function-survival requirements by... (a) identifying and explaining how the physical structure / characteristics of an organism allow it to survive and defend itself (eg. camouflage). (b) Analyzing the structures needed for survival of populations of plants and animals in a particular habitat / environment (eg., conserving water).	CEOC Classroom Aid #: LS1(14)-1,2

Suggested Activities

Use CEOC Classroom Aid LS1(14)-1,2 to help students understand beak and foot adaptations in different types of birds.

Use CEOC Classroom Aid LS1(14)-4 to match plants with some of their adaptations. For each adaptation, name at least one reason why it may be advantageous to the plant. Which adaptations are clearly for defense? Which adaptations help a plant obtain food?